Hydraulic Servo Systems

Programme course

6 credits

Hydrauliska servosystem

TMHP51

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2017-01-25

Main field of study
Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Mechanical Engineering, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Fluid power systems, Automatic Control

Intended learning outcomes
This course is intended to give a broad and deep knowledge in hydraulic servo systems. The knowledge aims for the course are:
- to convey deep knowledge about component functionality and characteristics in the area of Hydraulic Servo Systems.
- to give knowledge about calculation methods and system design.
- to convey knowledge about control principals and control engineering methods with respect to controllability and energy consumption.
- to give insight in measurement methods and computer usage for system analyses.

The skill aims for the course are:
- be able to model and analyse hydraulic servo systems with respect to performance, controllability and energy consumption.
- be able to apply calculation methods for component selections and system design.
- be able to perform measurements on components and systems.

Course content

- Basic theory: Columnar flow. Orifices. Disturbance forces on valve elements. Cavitation. Physical and chemical properties of hydraulic fluids.
- Simulation techniques: Simulation of dynamic characteristics of fluid power systems.
- Proportional/servo valves - design and properties of different pilot and main stage and amplifier card. Servo systems for control of position, speed and power. Loads with several degrees of freedom. Control strategies and dynamic properties

Teaching and working methods

The teaching consists of lectures, lessons and laboratory exercises. Educational study visits are made to different industries.

Examination

UPG1	Hand-in assignment	0.5 credits	U, G
LAB1	Laboratory Work	1.5 credits	U, G
TEN2	Written examination	4 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses: Fluid Power Systems and Transmissions, Mechanical Engineering Systems-Project Course

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Peter Hallberg

Examiner

Magnus Sethson

Course website and other links

http://www.iei.liu.se/flumes/tmhp51

Education components

Preliminary scheduled hours: 54 h
Recommended self-study hours: 106 h

Course literature

Kompendiematerial, Rydberg K-E, LiTH. Vetenskapliga artiklar. Tillgängligt via kurshemsidan.